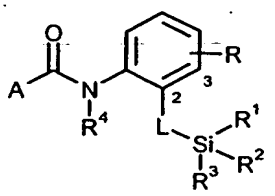
Patent claims

1. Silylated carboxamides of the formula (I)



(I)

in which

R represents hydrogen, fluorine, chlorine, methyl, isopropyl, methylthio or trifluoromethyl,

L represents a direct bond or represents in each case optionally substituted straight-chain or branched alkylene (alkanediyl), alkenylene (alkenediyl) or alkynylene (alkyndiyl),

R^1 and R^2 independently of one another represent hydrogen, C_1-C_8-alkyl, C_1-C_8-alkoxy, C_1-C_4-alkoxy-C_1-C_4-alkyl, C_1-C_4-alkylthio-C_1-C_4-alkyl or C_1-C_6-haloalkyl,

R^3 represents hydrogen, C_1-C_8-alkyl, C_1-C_8-alkoxy, C_1-C_4-alkoxy-C_1-C_4-alkyl, C_1-C_4-alkylthio-C_1-C_4-alkyl, C_2-C_8-alkenyl, C_2-C_8-alkynyl, C_1-C_6-haloalkyl, C_2-C_6-haloalkenyl, C_2-C_6-haloalkynyl, C_3-C_6-cycloalkyl, or represents in each case optionally substituted phenyl or phenylalkyl,

R^4 represents hydrogen, C_1-C_8-alkyl, C_1-C_6-alkylsulphinyl, C_1-C_6-alkylsulphonyl, C_1-C_4-alkoxy-C_1-C_4-alkyl, C_3-C_8-cycloalkyl; C_1-C_6-haloalkyl, C_1-C_4-haloalkylthio, C_1-C_4-haloalkylsulphinyl, C_1-C_4-haloalkylsulphonyl, halo-C_1-C_4-alkoxy-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; formyl, formyl-C_1-C_3-alkyl, (C_1-C_3-alkyl)carbonyl-C_1-C_3-alkyl, (C_1-C_3-alkoxy)carbonyl-C_1-C_3-alkyl; halo-(C_1-C_3-alkyl)carbonyl-C_1-C_3-alkyl, halo-(C_1-C_3-alkoxy)carbonyl-C_1-C_3-alkyl having in each case 1 to 13 fluorine, chlorine and/or bromine atoms;

(C_1-C_8-alkyl)carbonyl, (C_1-C_8-alkoxy)carbonyl, (C_1-C_4-alkoxy-C_1-C_4-alkyl)carbonyl, (C_3-C_8-cycloalkyl)carbonyl; (C_1-C_6-haloalkyl)carbonyl, (C_1-C_6-haloalkoxy)carbonyl, (halo-C_1-C_4-alkoxy-C_1-C_4-alkyl)carbonyl, (C_3-C_8-halocycloalkyl)carbonyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; or $-C(=O)C(=O)R^5$, $-CONR^6R^7$ or $-CH_2NR^8R^9$,

R^5 represents hydrogen, C_1-C_8-alkyl, C_1-C_8-alkoxy, C_1-C_4-alkoxy-C_1-C_4-alkyl, C_3-C_8-cycloalkyl; C_1-C_6-haloalkyl, C_1-C_6-haloalkoxy, halo-C_1-C_4-alkoxy-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,

R^6 and R^7 independently of one another each represent hydrogen, C_1-C_8-alkyl, C_1-C_4-alkoxy-C_1-C_4-alkyl, C_3-C_8-cycloalkyl; C_1-C_8-haloalkyl, halo-C_1-C_4-alkoxy-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,

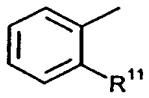
R^6 and R^7 furthermore together with the nitrogen atom to which they are attached form a saturated heterocycle having 5 to 8 ring atoms which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C_1-C_4-alkyl, where the heterocycle may contain 1 or 2 further nonadjacent heteroatoms from the group consisting of oxygen, sulphur and NR^{10},

R^8 and R^9 independently of one another, represent hydrogen, C_1-C_8-alkyl, C_3-C_8-cycloalkyl; C_1-C_8-haloalkyl, C_3-C_8-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,

R^8 and R^9 furthermore together with the nitrogen atom to which they are attached form a saturated heterocycle having 5 to 8 ring atoms which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C_1-C_4-alkyl, where the heterocycle may contain 1 or 2 further nonadjacent heteroatoms from the group consisting of oxygen, sulphur and NR^{10},

R^{10} represents hydrogen or C_1-C_6-alkyl,

A represents the radical of the formula (A1)

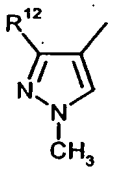


(A1) in which

R^{11} represents hydrogen, halogen, hydroxyl, cyano, C_1-C_6-alkyl, C_1-C_4-haloalkyl, C_1-C_4-haloalkoxy or C_1-C_4-haloalkylthio having in each case 1 to 5 halogen atoms,

or

A represents the radical of the formula (A2)

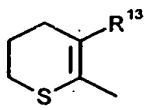


(A2) in which

R^{12} represents chlorine, iodine or dichloromethyl,

or

A represents the radical of the formula (A3)

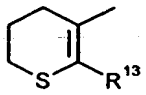


(A3) in which

R^{13} represents C_1-C_4-alkyl or C_1-C_4-haloalkyl having 1 to 5 halogen atoms,

or

A represents the radical of the formula (A4)

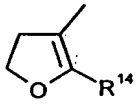


(A4) in which

R^{13} represents C_1-C_4-alkyl or C_1-C_4-haloalkyl having 1 to 5 halogen atoms,

or

A represents the radical of the formula (A5)

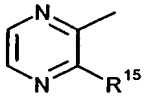


(A5) in which

R^{14} represents C_1-C_4-alkyl or C_1-C_4-haloalkyl having 1 to 5 halogen atoms,

or

A represents the radical of the formula (A6)

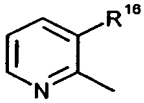


(A6) in which

R^{15} represents hydrogen, halogen, C_1-C_4-alkyl or C_1-C_4-haloalkyl having 1 to 5 halogen atoms,

or

A represents the radical of the formula (A7)

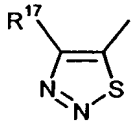


(A7) in which

R^{16} represents halogen, hydroxyl, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_1-C_4-haloalkyl, C_1-C_4-haloalkylthio or C_1-C_4-haloalkoxy having in each case 1 to 5 halogen atoms,

or

A represents the radical of the formula (A8)

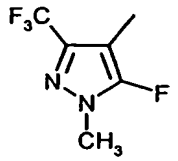


(A8) in which

R^{17} represents C_1-C_4-alkyl,

or

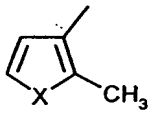
A represents the radical of the formula (A9)



(A9),

or

A represents the radical of the formula (A10)

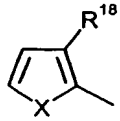


(A10) in which

X represents O (oxygen) or S (sulphur),

or

A represents the radical of the formula (A11)



(A11) in which

X represents O (oxygen) or S (sulphur),

R^{18} represents iodine or methyl.

2. Silylated carboxamides of the formula (I) according to Claim 1, characterized in that

R represents hydrogen, fluorine, chlorine, methyl or trifluoromethyl,

L represents a direct bond or represents in each case optionally halogen-substituted straight-chain or branched C_1-C_6-alkylene, C_2-C_6-alkenylene or C_2-C_6-alkynylene,

R^1 and R^2 independently of one another represent C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_3-alkoxy-C_1-C_3-alkyl or C_1-C_3-alkylthio-C_1-C_3-alkyl,

R^3 represents C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_3-alkoxy-C_1-C_3-alkyl, C_1-C_3-alkylthio-C_1-C_3-alkyl, C_3-C_6-cycloalkyl, phenyl or benzyl,

R^4 represents hydrogen, C_1-C_6-alkyl, C_1-C_4-alkylsulphinyl, C_1-C_4-alkylsulphonyl, C_1-C_3-alkoxy-C_1-C_3-alkyl, C_3-C_6-cycloalkyl; C_1-C_4-haloalkyl, C_1-C_4-haloalkylthio, C_1-C_4-haloalkylsulphinyl, C_1-C_4-haloalkylsulphonyl, halo-C_1-C_3-alkoxy-C_1-C_3-alkyl, C_3-C_8-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; formyl, formyl-C_1-C_3-alkyl, (C_1-C_3-alkyl)carbonyl-C_1-C_3-alkyl, (C_1-C_3-alkoxy)carbonyl-C_1-C_3-alkyl; halo-(C_1-C_3-alkyl)carbonyl-C_1-C_3-alkyl, halo-(C_1-C_3-alkoxy)carbonyl-C_1-C_3-alkyl having in each case 1 to 13 fluorine, chlorine and/or bromine atoms;

(C_1-C_6-alkyl)carbonyl, (C_1-C_4-alkoxy)carbonyl, (C_1-C_3-alkoxy-C_1-C_3-alkyl)carbonyl, (C_3-C_6-cycloalkyl)carbonyl; (C_1-C_4-haloalkyl)carbonyl, (C_1-C_4-haloalkoxy)carbonyl, (halo-C_1-C_3-alkoxy-C_1-C_3-alkyl)carbonyl, (C_3-C_6-halocycloalkyl)carbonyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms, or $-C(=O)C(=O)R^5$, $-CONR^6R^7$ or $-CH_2NR^8R^9$,

R^5 represents hydrogen, C_1-C_6-alkyl, C_1-C_4-alkoxy, C_1-C_3-alkoxy-C_1-C_3-alkyl, C_3-C_6-cycloalkyl; C_1-C_4-haloalkyl, C_1-C_4-haloalkoxy, halo-C_1-C_3-alkoxy-C_1-C_3-alkyl, C_3-C_6-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,

R^6 and R^7 independently of one another each represent hydrogen, C_1-C_6-alkyl, C_1-C_3-alkoxy-C_1-C_3-alkyl, C_3-C_6-cycloalkyl; C_1-C_4-haloalkyl, halo-C_1-C_3-alkoxy-C_1-C_3-alkyl, C_3-C_6-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,

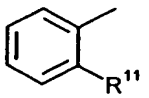
R^6 and R^7 furthermore together with the nitrogen atom to which they are attached form a saturated heterocycle having 5 or 6 ring atoms which is optionally mono- to tetrasubstituted by identical or different substituents from the group consisting of halogen and C_1-C_4-alkyl, where the heterocycle may contain 1 or 2 further non-adjacent heteroatoms from the group consisting of oxygen, sulphur and NR^{10},

R^8 and R^9 independently of one another represent hydrogen, C_1-C_6-alkyl, C_3-C_6-cycloalkyl; C_1-C_4-haloalkyl, C_3-C_6-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,

R^8 and R^9 furthermore together with the nitrogen atom to which they are attached form a saturated heterocycle having 5 or 6 ring atoms which is optionally mono- or polysubstituted by identical or different substituents from the group consisting of halogen and C_1-C_4-alkyl, where the heterocycle may contain 1 or 2 further non-adjacent heteroatoms from the group consisting of oxygen, sulphur and NR^{10},

R^{10} represents hydrogen or C_1-C_4-alkyl,

A represents the radical of the formula (A1)

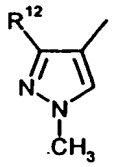


(A1) in which

R^{11} represents hydrogen, fluorine, chlorine, bromine, iodine, hydroxyl, cyano, C_1-C_4-alkyl, C_1-C_2-haloalkyl, C_1-C_2-haloalkoxy or C_1-C_2-haloalkylthio having in each case 1 to 5 fluorine, chlorine and/or bromine atoms,

or

A represents the radical of the formula (A2)

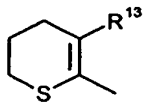


(A2) in which

R^{12} represents chlorine, iodine or dichloromethyl,

or

A represents the radical of the formula (A3)

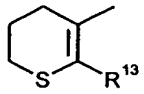


(A3) in which

R^{13} represents methyl, ethyl or C_1-C_2-haloalkyl having 1 to 5 fluorine, chlorine and/or bromine atoms,

or

A represents the radical of the formula (A4)

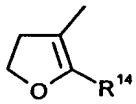


(A4) in which

R^{13} represents methyl, ethyl or C_1-C_2-haloalkyl having 1 to 5 fluorine, chlorine and/or bromine atoms,

or

A represents the radical of the formula (A5)

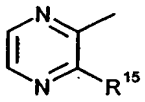


(A5) in which

R^{14} represents methyl, ethyl or C_1-C_2-haloalkyl having 1 to 5 fluorine, chlorine and/or bromine atoms,

or

A represents the radical of the formula (A6)

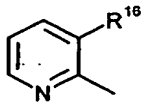


(A6) in which

R^{15} represents hydrogen, fluorine, chlorine, bromine, methyl, ethyl or C_1-C_2-haloalkyl having 1 to 5 fluorine, chlorine and/or bromine atoms,

or

A represents the radical of the formula (A7)

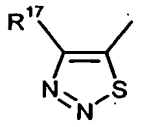


(A7) in which

R^{16} represents fluorine, chlorine, bromine, iodine, hydroxyl, C_1-C_4-alkyl, methoxy, ethoxy, methylthio, ethylthio, difluoromethylthio, trifluoromethylthio, C_1-C_2-haloalkyl or C_1-C_2-haloalkoxy having in each case 1 to 5 fluorine, chlorine and/or bromine atoms,

or

A represents the radical of the formula (A8)

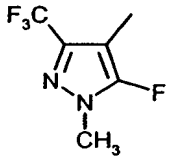


(A8) in which

R^{17} represents methyl, ethyl, n-propyl or isopropyl,

or

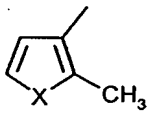
A represents the radical of the formula (A9)



(A9),

or

A represents the radical of the formula (A10)

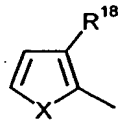


(A10) in which

X represents O (oxygen) or S (sulphur),

or

A represents the radical of the formula (A11)



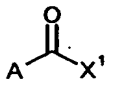
(A11) in which

X represents O (oxygen) or S (sulphur),

R^{18} represents iodine or methyl.

3. Process for preparing silylated carboxamides of the formula (I) according to Claim 1, characterized in that

a) carboxylic acid derivatives of the formula (II)



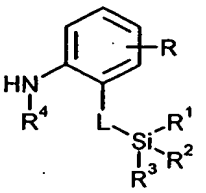
(II)

in which

X^1 represents halogen or hydroxyl and

A is as defined in Claim 1

are reacted with amines of the formula (III)



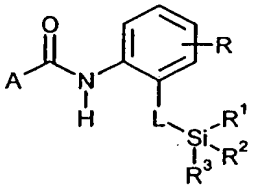
(III)

in which R, L, R^1, R^2, R^3 and R^4 are as defined in Claim 1,

if appropriate in the presence of a catalyst, if appropriate in the presence of a condensing agent, if appropriate in the presence of an acid binder and if appropriate in the presence of a diluent,

or

b) silylated carboxamides of the formula (I-1)



(I-1)

in which R, L, R^1, R^2, R^3 and A are as defined in Claim 1,

are reacted with halides of the formula (VIII)

$R^{4a}—X^2$ (VIII)

in which

X^2 represents chlorine, bromine or iodine,

R^{4a} represents C_1-C_8-alkyl, C_1-C_6-alkylsulphinyl, C_1-C_6-alkylsulphonyl, C_1-C_4-alkoxy-C_1-C_4-alkyl, C_3-C_8-cycloalkyl; C_1-C_6-haloalkyl, C_1-C_4-haloalkylthio, C_1-C_4-haloalkylsulphinyl, C_1-C_4-haloalkylsulphonyl, halo-C_1-C_4-alkoxy-C_1-C_4-alkyl, C_3-C_8-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; formyl, formyl-C_1-C_3-alkyl, (C_1-C_3-alkyl)carbonyl-C_1-C_3-alkyl, (C_1-C_3-alkoxy)carbonyl-C_1-C_3-alkyl; halo-(C_1-C_3-alkyl)carbonyl-C_1-C_3-alkyl, halo-(C_1-C_3-alkoxy)carbonyl-C_1-C_3-alkyl having in each case 1 to 13 fluorine, chlorine and/or bromine atoms;

(C_1-C_8-alkyl)carbonyl, (C_1-C_8-alkoxy)carbonyl, (C_1-C_4-alkoxy-C_1-C_4-alkyl)carbonyl, (C_3-C_8-cycloalkyl)carbonyl; (C_1-C_6-haloalkyl)carbonyl, (C_1-

C_6-haloalkoxy)carbonyl, (halo-C_1-C_4-alkoxy-C_1-C_4-alkyl)carbonyl, (C_3-C_8-halocycloalkyl)carbonyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; or $-C(=O)C(=O)R^5$, $-CONR^6R^7$ or $-CH_2NR^8R^9$, where R^5, R^6, R^7, R^8 and R^9 are as defined in Claim 1,

in the presence of a base and in the presence of a diluent.

4. Compositions for controlling unwanted microorganisms, characterized in that they comprise at least one silylated carboxamide of the formula (I) according to Claim 1, in addition to extenders and/or surfactants.

5. Use of silylated carboxamides of the formula (I) according to Claim 1 for controlling unwanted microorganisms.

6. Method for controlling unwanted microorganisms, characterized in that silylated carboxamides of the formula (I) according to Claim 1 are applied to the microorganisms and/or their habitats.

7. Process for preparing compositions for controlling unwanted microorganisms, characterized in that silylated carboxamides of the formula (I) according to Claim 1 are mixed with extenders and/or surfactants.